ANNOUNCEMENTS

BSC 360 Plant Biology

- 4 hrs
- Lab
- W course
- Similar schedule
- No collection
- Birmingham Botanical Gardens

Medical School Average MCAT Scores and GPA

These figures were taken from the 2008-2009 edition of the Medical School Admission Requirements book, published by the AAMC. You can order a copy at www.aamc.org.

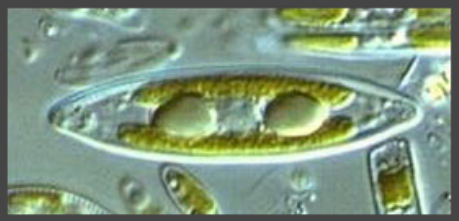
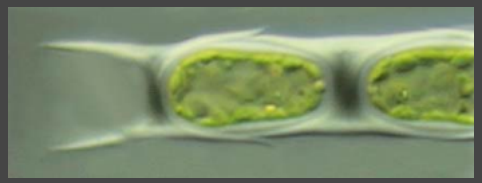
Students should not choose to apply to schools solely based on average GPA and MCAT scores! It is important that you also look at curriculum, opportunities outside of the classroom, geographical considerations, match to the school's mission, etc.

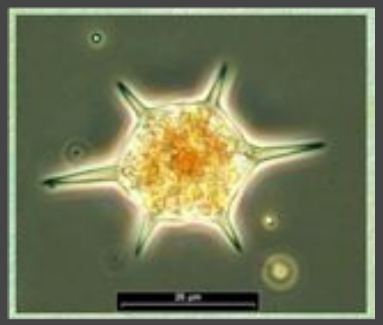
Be certain that you investigate whether a public school will accept out-of-state applicants, if you are not a resident of that state.

The GPA's listed are for *accepted* applicants, not *matriculated* students.

School Name	State	Public (Y/N)	Overall GPA Median	Science GPA Median	Average MCAT
University of Alabama School of Medicine	AL	Y	3.79	3.77	10P
University of South Alabama College of Medicine	AL	Y	3.72	3.62	9.7Q
University of Arkansas College of Medicine	AR	Y	3.69	3.61	9.7O
The University of Arizona College of Medicine	AZ	Y	3.67	3.59	10P
David Geffen School of Medicine at UCLA	CA	Y	3.68	3.66	11Q
Keck Sch. of Med.University of Southern California	CA	N	3.68	3.66	11Q
Loma Linda University School of Medicine	CA	N	3.78	3.73	10P
Stanford University School of Medicine	CA	N	3.8	3.79	11.7Q
UCLA/Drew Medical Education Program	CA	Y	3.82	3.83	11.7Q
University of California San Diego	CA	Y	3.82	3.82	11.7Q
University of California San Francisco	CA	Y	3.8	3.79	11.7Q
University of California, Davis School of Medicine	CA	Y	3.68	3.66	11Q
University of California, Irvine- College/Medicine	CA	Y	3.75	3.75	10.7Q
University of Colorado School of Medicine	CO	Y	3.78	3.76	11Q
University of Connecticut School of Medicine	CT	Y	3.7	3.69	10.7Q
Yale University School of Medicine	CT	N	3.81	3.8	11.7Q
George Washington University Sch of Med	DC	N	3.59	3.49	10P
Georgetown University School of Medicine	DC	N	3.69	3.65	10.3Q
Howard University	DC	N	3.38	3.24	8.3O

The remaining groups of algae are economically and ecologically important but their relationships are still not very well understood



Cryptophytes

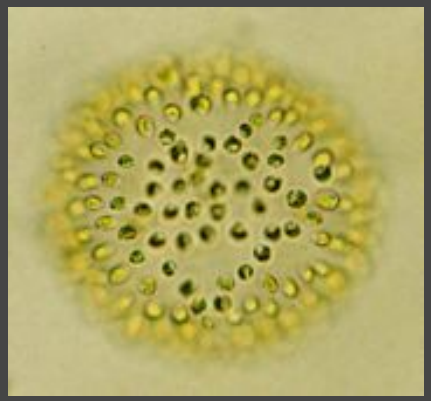
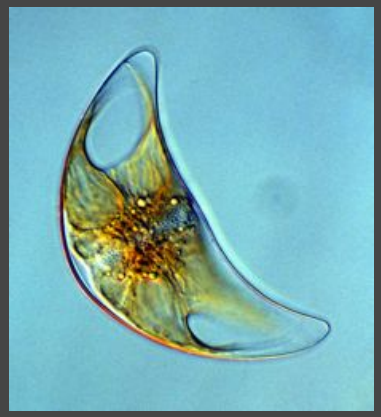
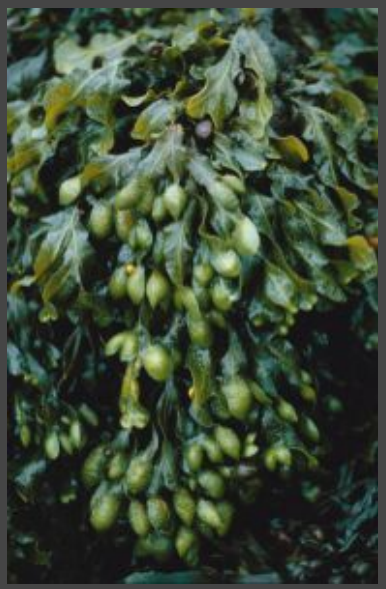
Alvaeolates (Dinoflagellates)

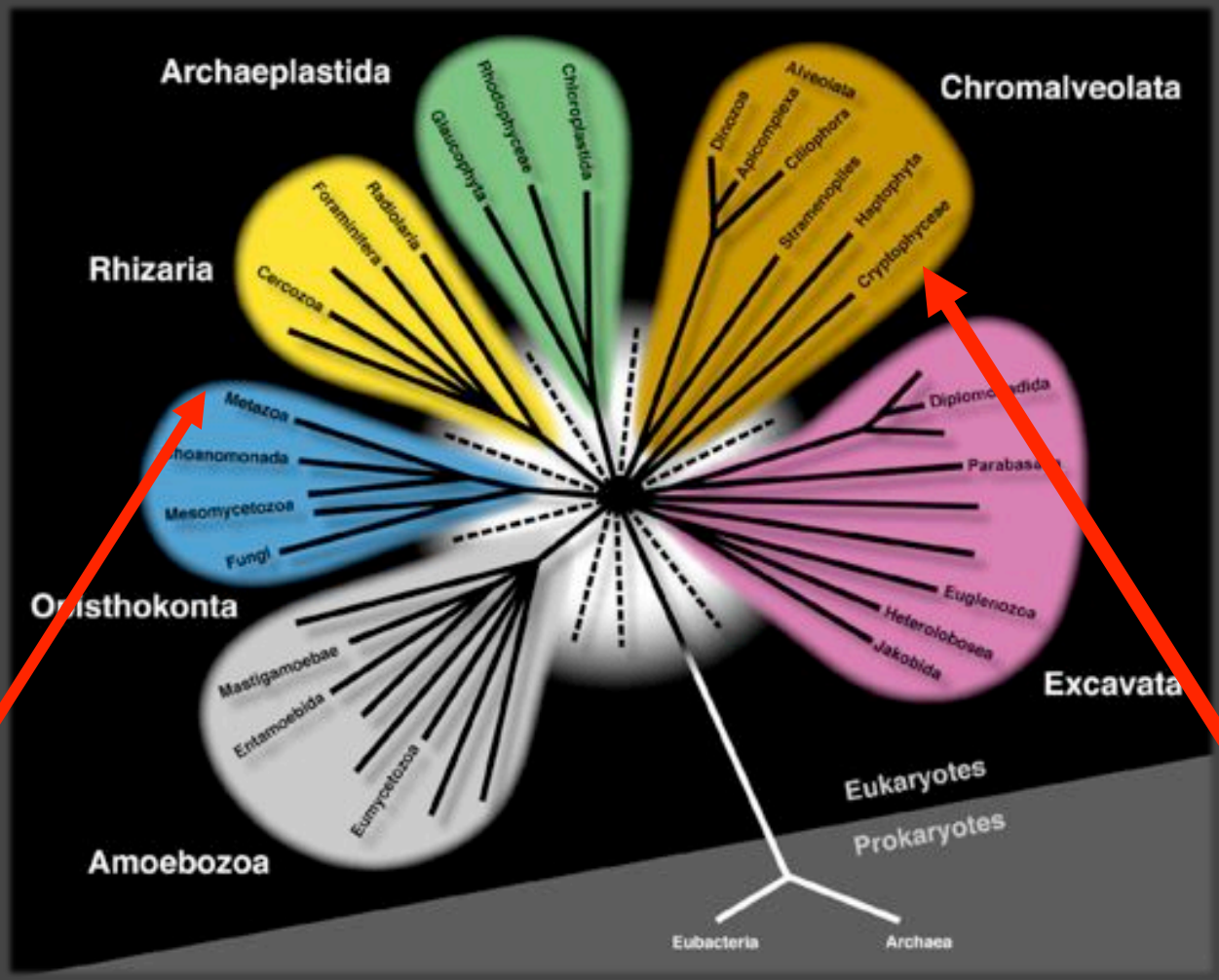
Stramenopiles

Haptophytes

(CASH)





You are here!

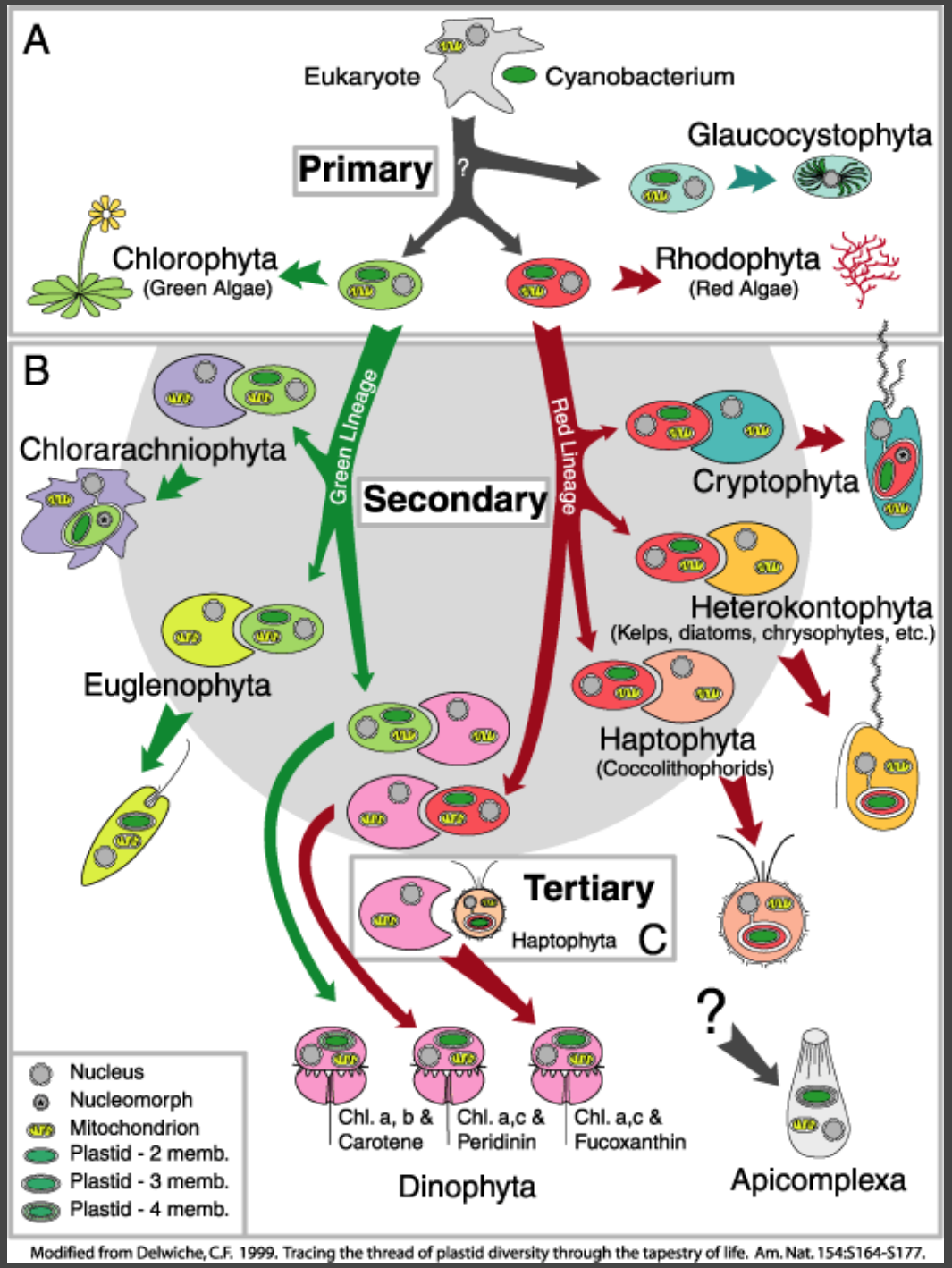
The rest of the algae to be studied are here!

They belong to the red algal lineage:

- Cryptophyta
- Stramenopiles (Heterokontophyta)
- Haptophyta
- Alveolates (Dinoflagellates)

Did secondary red plastids arise more than once?

There are two hypotheses (pp.142-143) addressing this question

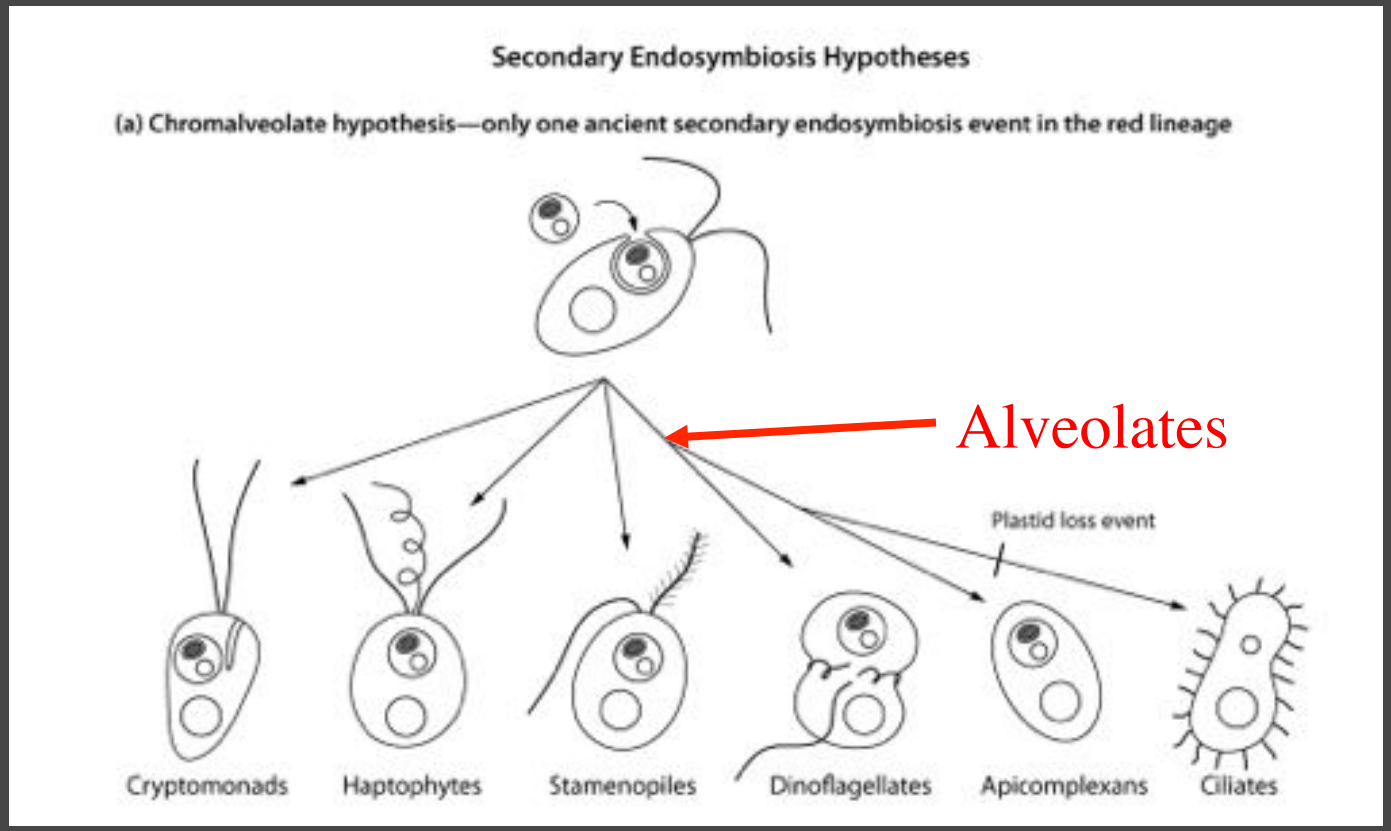


Modified from Delwiche, C.F. 1999. Tracing the thread of plastid diversity through the tapestry of life. Am. Nat. 154:S164-S177.

The Chromalveolate hypothesis

This theory proposes that secondary red plastids, containing chlorophyll *c* and *a*, originated only once in a common ancestor of cryptomonads, haptophytes, stramenopiles and alveolates; this monophyletic group is called the Chromalveolates

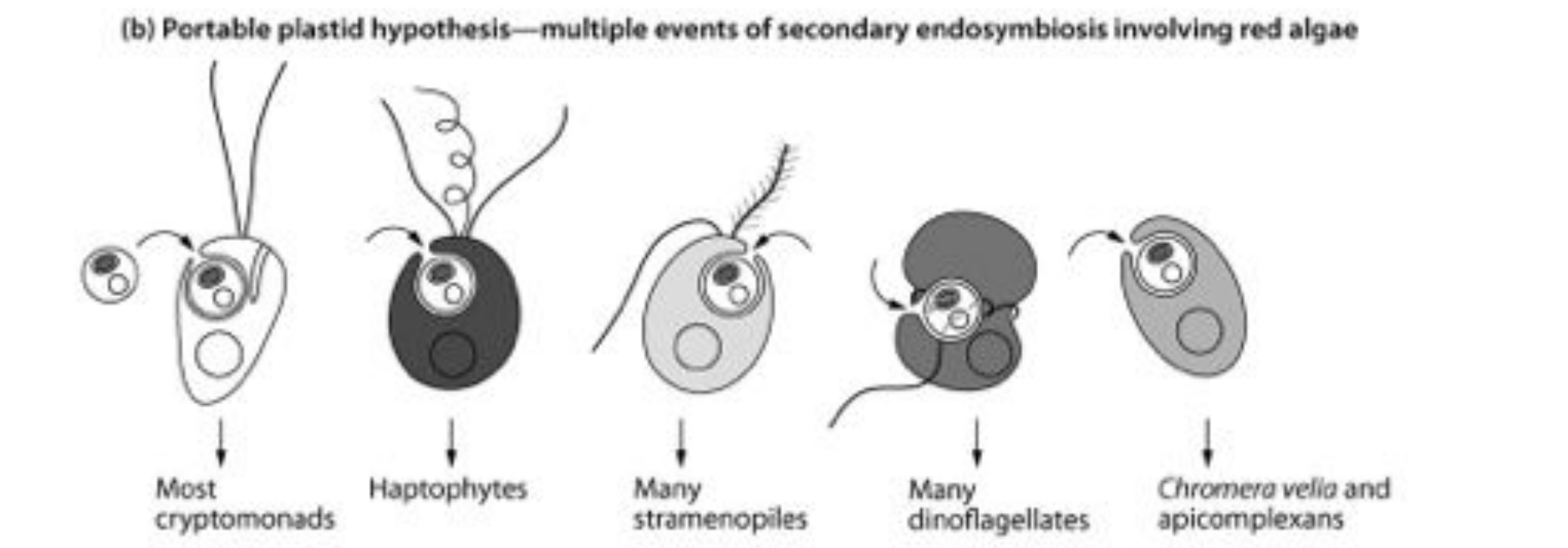
Similar plastid-target genes are cited as evidence



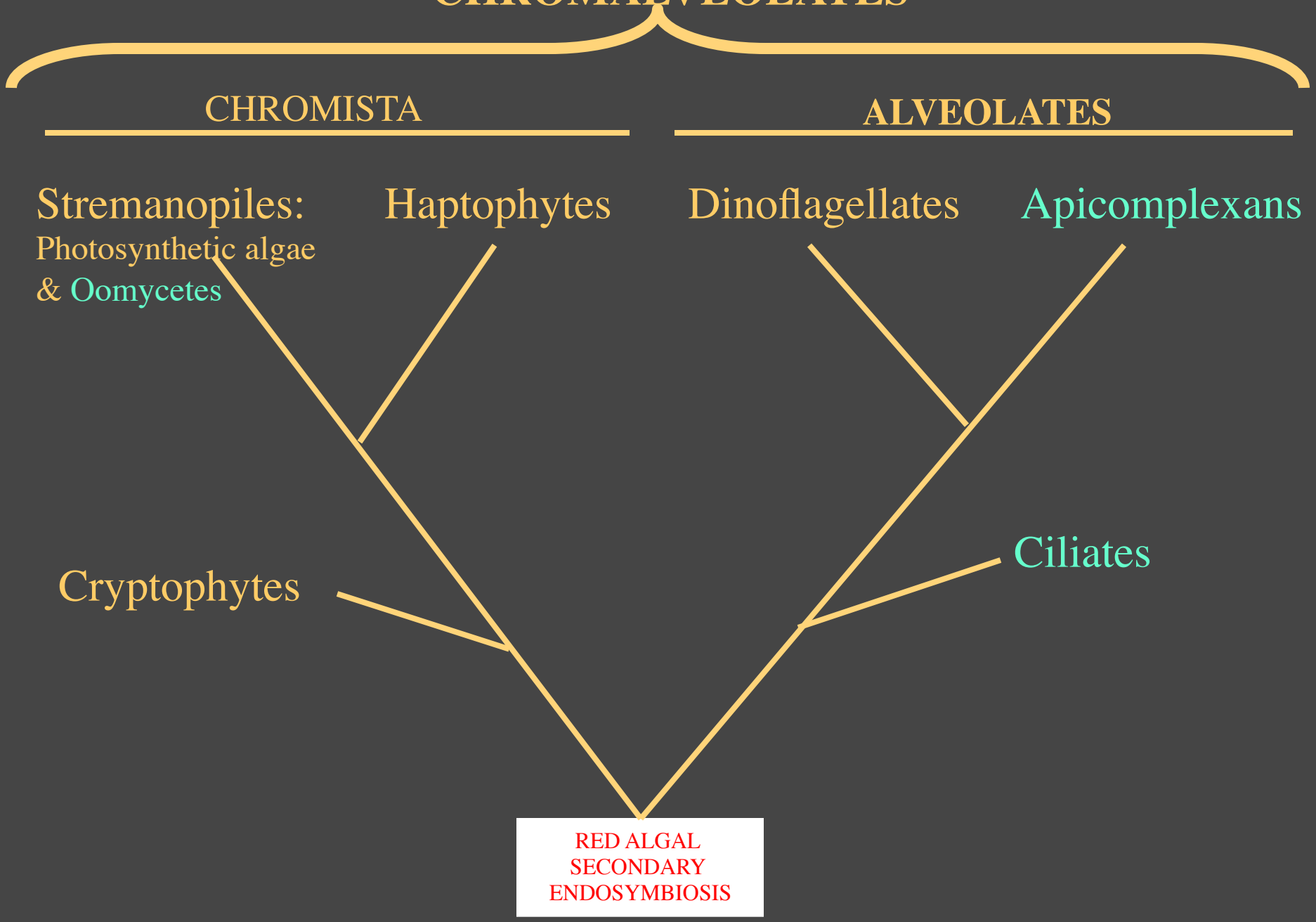
The Portable plastid hypothesis

This alternative hypothesis contends that secondary red plastids have originated more than once. Since red plastids have a larger set of genes (other than greens), then red plastids have greater genetic autonomy, and consequently more easily incorporated into new hosts cells (they are more "portable")

The *rbc*S genes in green and reds are cited as evidence



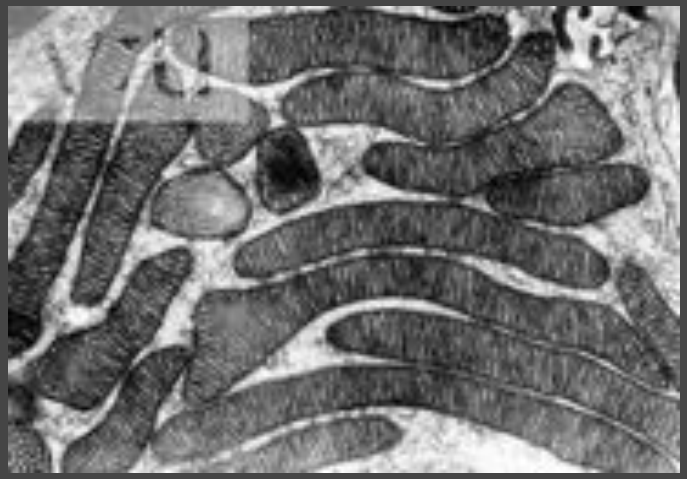
CHROMALVEOLATES



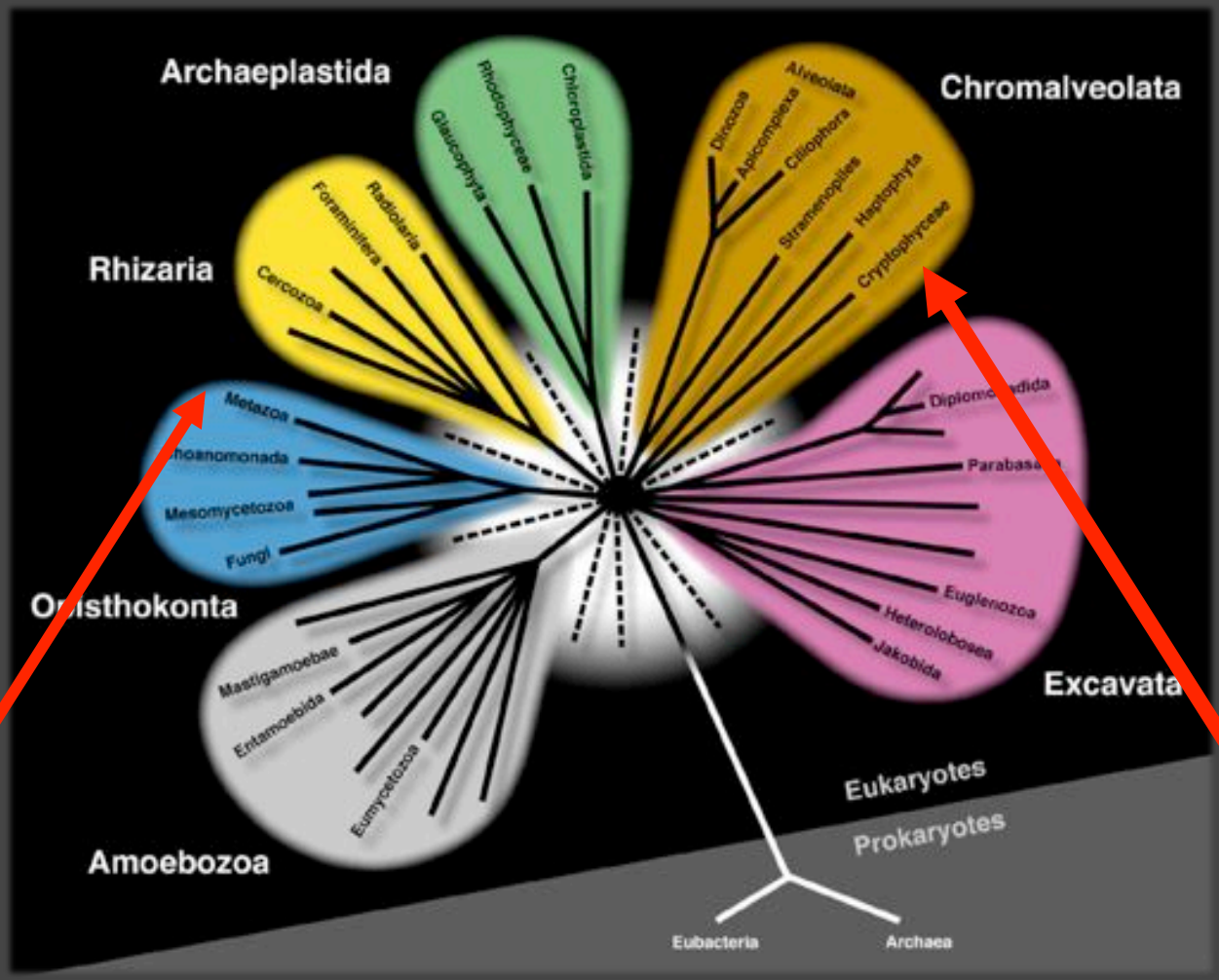
CHROMALVEOLATES (CASH): Evolved chlorophyll *c*, supported by DNA sequences, monophyletic group

- CHROMISTS: Flatenned (FMC) or tubular mitochondrial cristae (TMC) w/o sacs or alveoli under plasmalemma:
  - Cryptophytes (flat MC)
  - Haptophytes
  - Stramenopile algae, Oomycetes

- ALVEOLATES: Tubular mitochondrial cristae AND alveoli:
  - Parasitic Apicomplexans
  - Plastid-less Ciliates
  - Dinoflagellates



CRYPTOPHYTA
The Cryptomonads



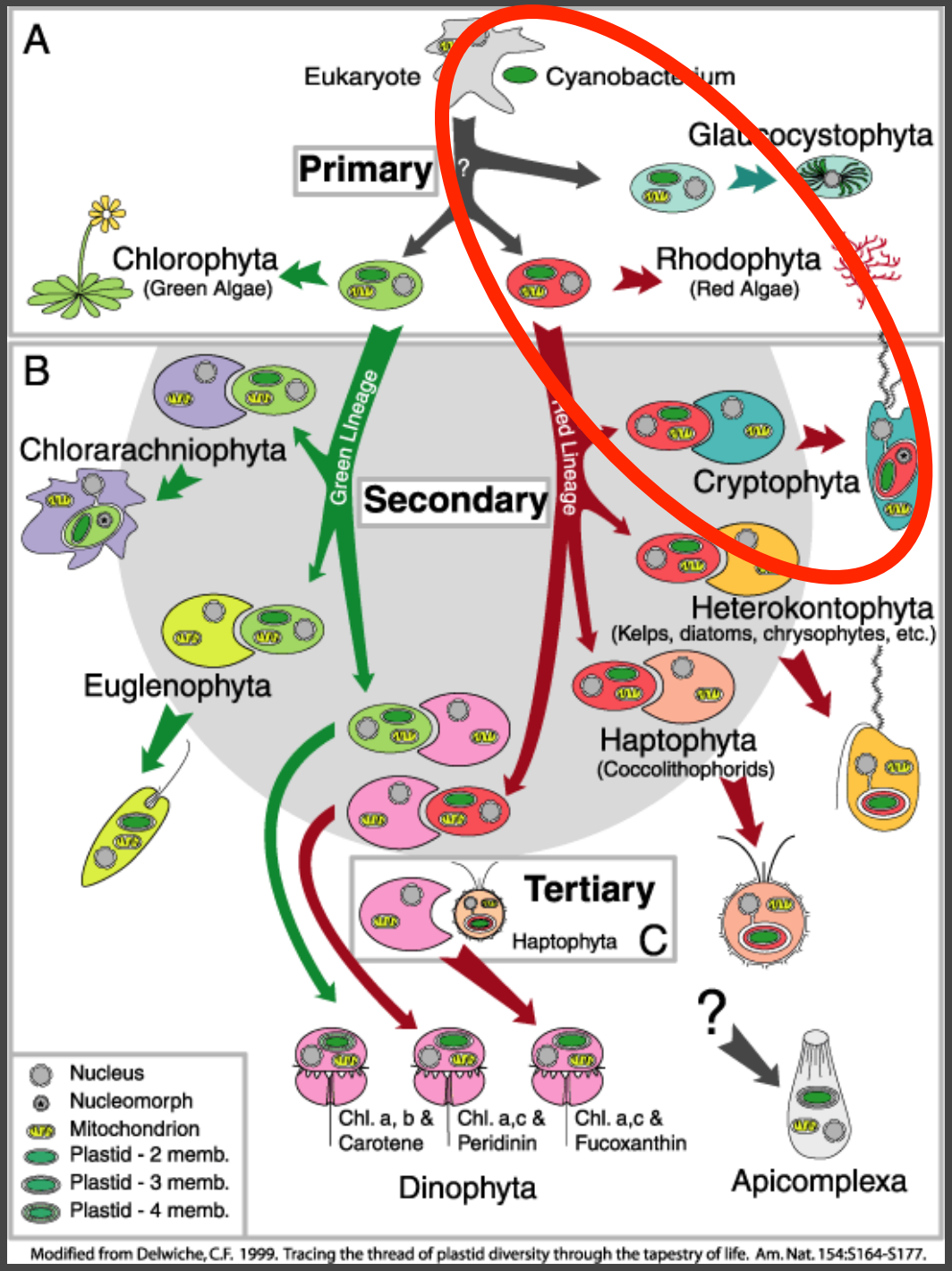
You are here!

Cryptophtyes are here

Cryptomonads are another example of secondary endosymbiosis, but in this case from the Red Lineage.

Their plastids represent an ancestral eukaryotic red algal cell.

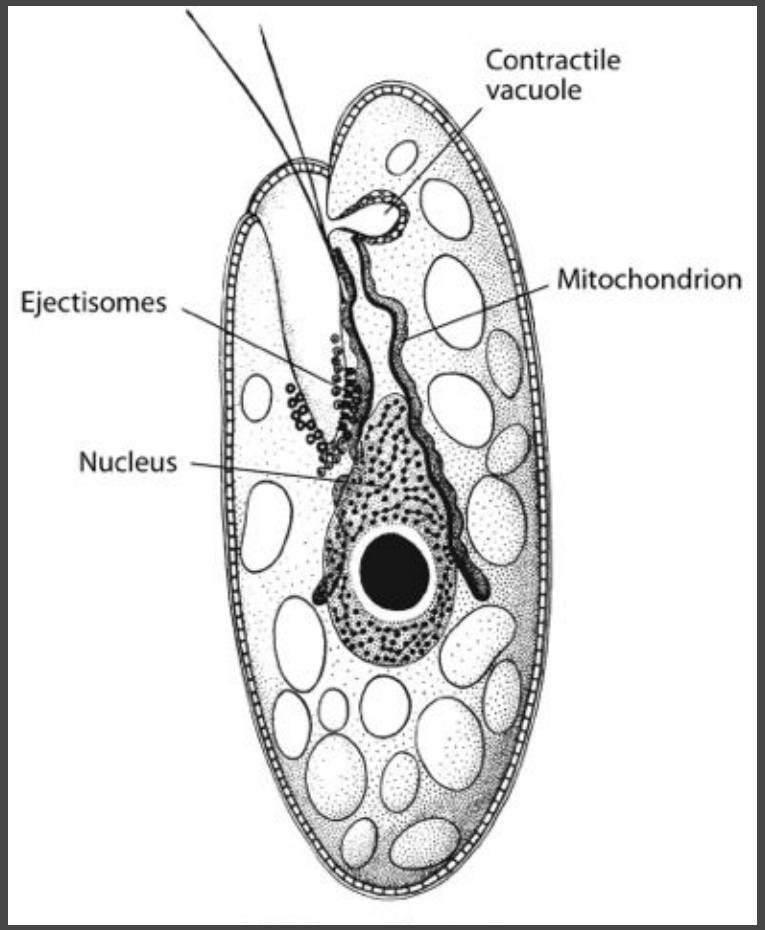
Host is related to rhizopodial protozoa

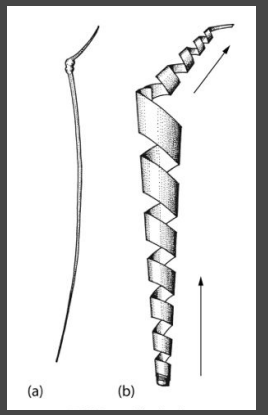


Modified from Delwiche, C.F. 1999. Tracing the thread of plastid diversity through the tapestry of life. Am. Nat. 154:S164-S177.

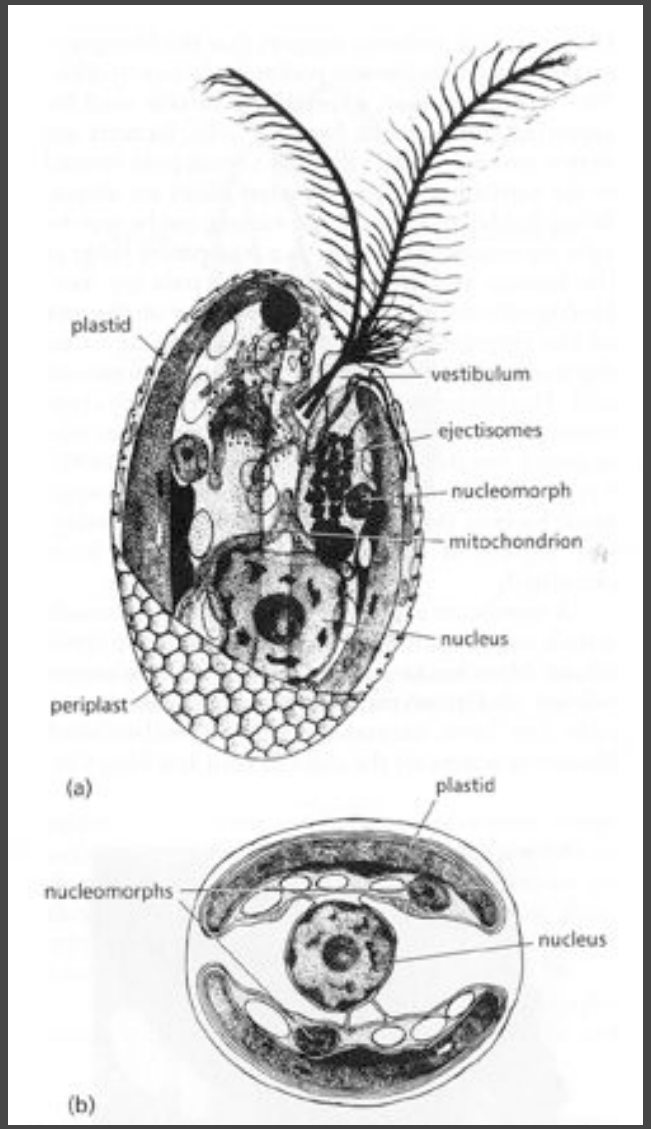
Cryptomonads (Cryptophytes)

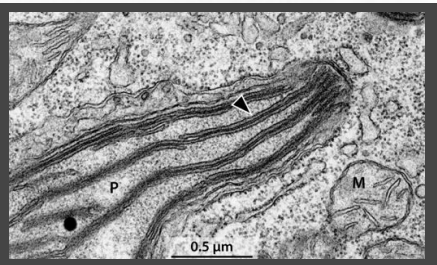
1. Unicellular and very small
2. Freshwater and marine plankton
   They are usual prey of ciliates and dinos that steal their plastids!
   =Kleptoplastidy
3. Chlorophylls *a* & *c*, and PHYCOBILINS!
   phycoerythrin OR phycocyanin
   One special xanthophyll: Alloxanthin
   NEVER phycobilisomes!!!
4. Starch
5. Two subapical flagella with hairs (stichonematic)
   From a depression or Vestibulum
6. Plasmalemma sandwiched between two layers of proteins forming the Periplast
7. Ejectisomes (tightly coiled ribbons)
8. No eyespot





9. Chloroplasts with 4 membranes (the outer two membranes are connected to the Endoplasmic Reticulum = Periplastidial endoplasmic reticulum (PER)
10. The space between outer and inner pairs of plastid membranes: Periplastidial compartment
11. The Periplastidial compartment contains: Nucleomorph (reduced nucleus), starch grains and eukaryotic ribosomes!!!)
12. Nucleomorphs contain a double membrane with pores, chromosomal DNA and a nucleolus
13. Flattaned mitochondrial cristae
14. Auxotrophic
15. Thylakoids stacked in 2's
16. Reproduction by cell division formation of resting cysts, and few engage in sexual reproduction (isogamy)



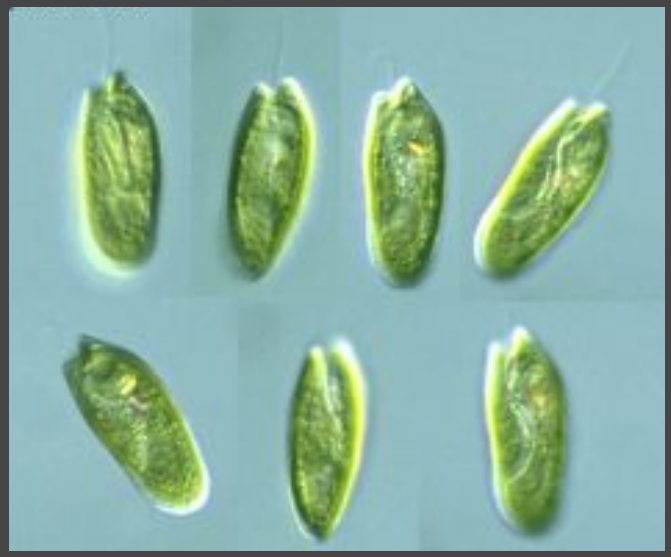


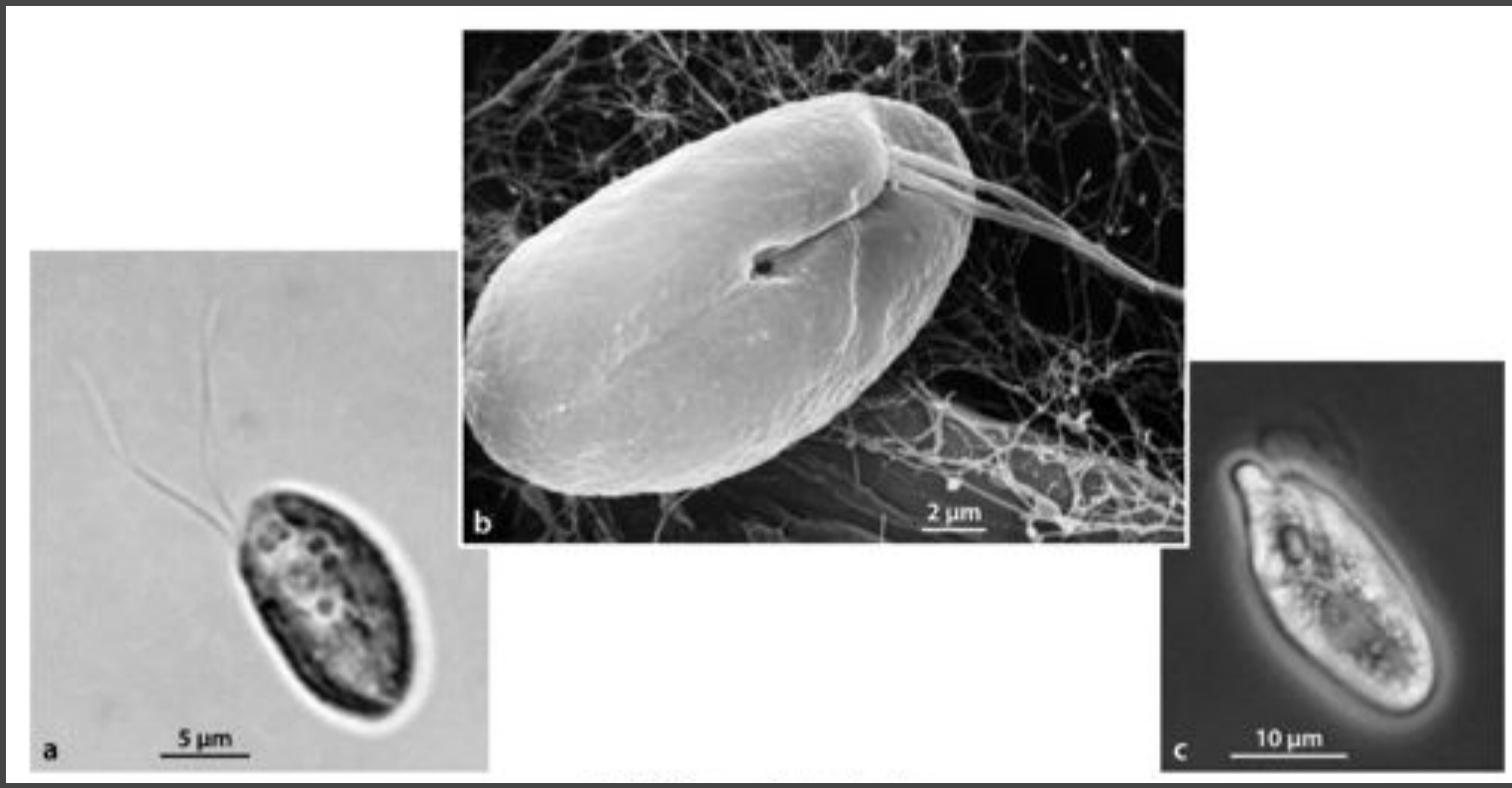
Cryptomonas sp.

Widespread freshwater genus

Brown in color

Plastid and colorless species





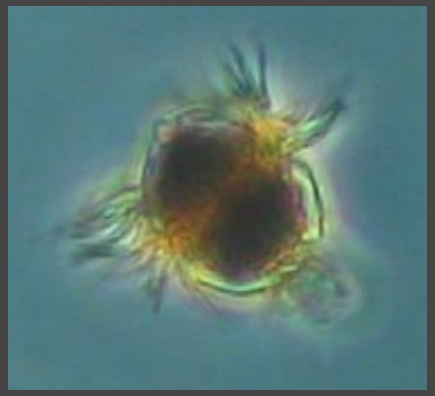
Ecology

In freshwater and marine habitats

Abundant in the phytoplankton but overlooked by their size

Endosymbionts in invertebrates, protozoa, and dinoflagellates

Myrionecta rubra, a ciliate, discoloring seawater reddish brown, containing ingests cryptomonads and harvest their plastids, nuclei, and mitochondria (Kleptoplastidy)



Myrionecta rubra

Reddish bloom